

astro

PHOTOMETRIC
TEST REPORT

Report Number	SPH-21233
Customer	Astro Lighting Limited
Contact	Ross Dickson
Product Type	LED Wall light
Test Purpose	Generation of photometric data
Quote Reference	Q-LUX17-21659
Works Order Number	WO-11880
Test Item Reference	TI-15095
LAB Test Method Reference	TES-101001
Test Standards	LM-79-08; (BS) EN 13032-4:2015; CIE S025:2015
Lab Location Reference	LUX-TSI
Tested by	Mike Sewell
Date of Test	07/06/2018
Reviewed by	Menno Schakel
Number of products tested	1

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Signed:




Boston 370

Date: 11/06/2018

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This report contains data acquired in full compliance to LM-79-08; (BS) EN 13032-



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4:2015; CIE S025:2015

Nomenclature

Lamp Orientation described below relates to the position in which a lamp is designed to operate for maximum performance and safety, these include:

BD - Base Down (bulb is vertically positioned with the metal base at the bottom, glass up)

BU - Base Up (bulb is vertically positioned with the metal base at the top, glass hanging down)

HBD - Horizontal $+15^{\circ}$ to Base Down

H45 - Horizontal to -45° only

VBU - Vertical Base Up $\pm 15^{\circ}$

VBD - Vertical Base Down $\pm 15^{\circ}$

HBU - Base Up $\pm 90^{\circ}$ (bulb can be operated in a base up or horizontal position)

HOR - Horizontal Burn (bulb is positioned with the metal base parallel to the ground)

H75 - Horizontal $\pm 75^{\circ}$ (bulb should not be operated within 15° of vertical)

U - Universal Burn (burn can be operated in any position)

Test Conditions

Measurements were made with an ambient temperature of $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. Measurements were taken only after sufficient time for thermal stabilisation has been allowed. Thermal stabilisation according to LM-79-08; (BS) EN 13032-4:2015; CIE S025:2015 was achieved before measurements are measured and

Calibrations

The integrating sphere spectroradiometer system has been calibrated using a Reference Standard Lamp traceable to NPL.

Test Equipment

Labsphere Integrating Sphere Spectroradiometer System - 1m (40")

Kikusui AC Stable Power Supply

Rigol DC Power Supply

Yokogawa AC/DC Power Meter and Analyser

Yokogawa Digital Multimeter(s)

Temperature Monitor

Data Formats

Spectral Data file from which the calculation of chromaticity and CRI etc. have been performed and the derived results from the LightMtrX software are provided in this report

All photometric data for LED products will be provided in ABSOLUTE photometric format and all non-LED data will be in relative photometric format with lamp lumens measured separately, where possible, for LOR estimation.



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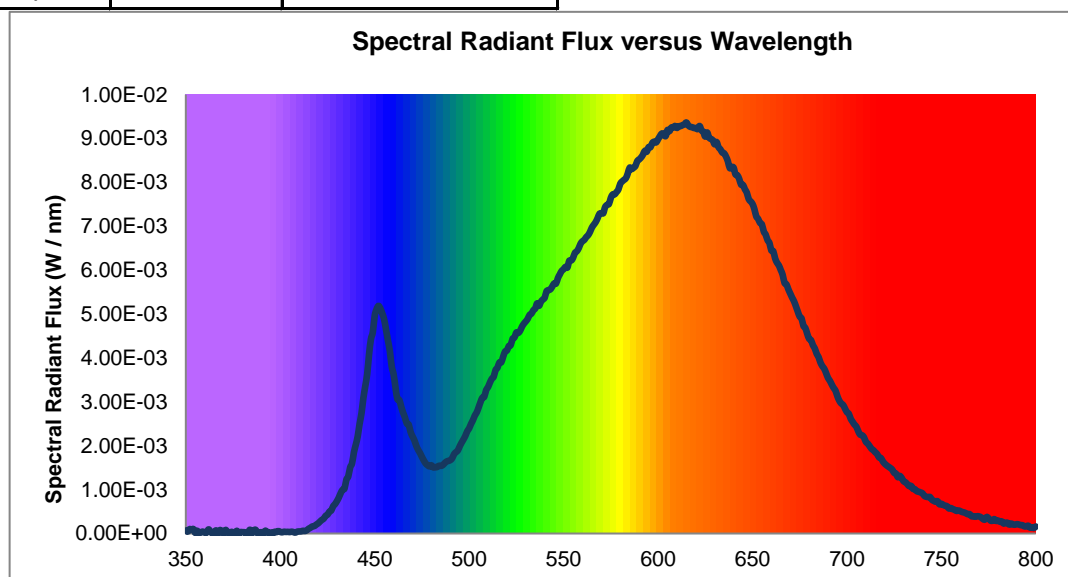
Product Name	Boston 370
Part/Serial Number	N/A
Type of Product	LED Wall light
Base Type	N/A - Luminaire
Driver Type	Internal
Test Time	1 mins
Operating Orientation	Horizontal
Test Orientation	Horizontal
Ambient Temperature	25.4°C
Manufacturer	Astro Lighting Limited
Date of Manufacturer	Not Available
Thermal Management	Passive
Dimmable	No
Pre-Burning Time	0 hours
Stabilisation Time	75 mins
Humidity	<65% RH

Driver Details		
Manufacturer		
Model		
Part/Serial #		
Rated Voltage		
Output	Current	
	Voltage	

Photometric Measurements	
Luminous Flux	465 lm
Luminous Efficacy	33 lm/W

Dimension	Sample	Luminous Opening
Diameter/Width	80 mm	60 mm
Length	80 mm	60 mm
Height/Depth	370 mm	350 mm

Electrical Measurements	
Frequency	50 Hz
Power Factor	0.374
Power	13.95 W
Voltage	230.15 V
Current	0.162 A
Apparent Power	37.31 VA





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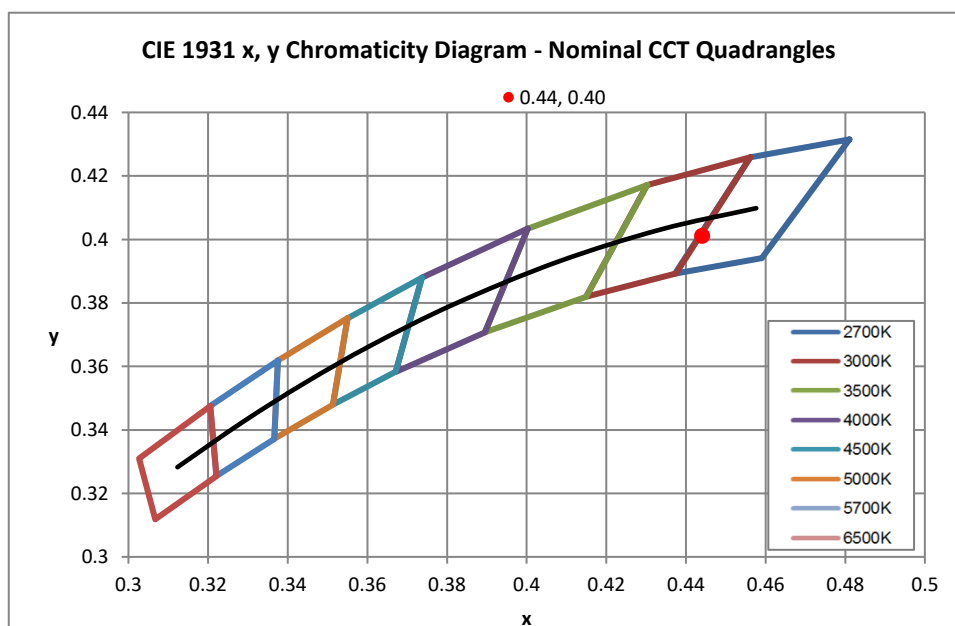
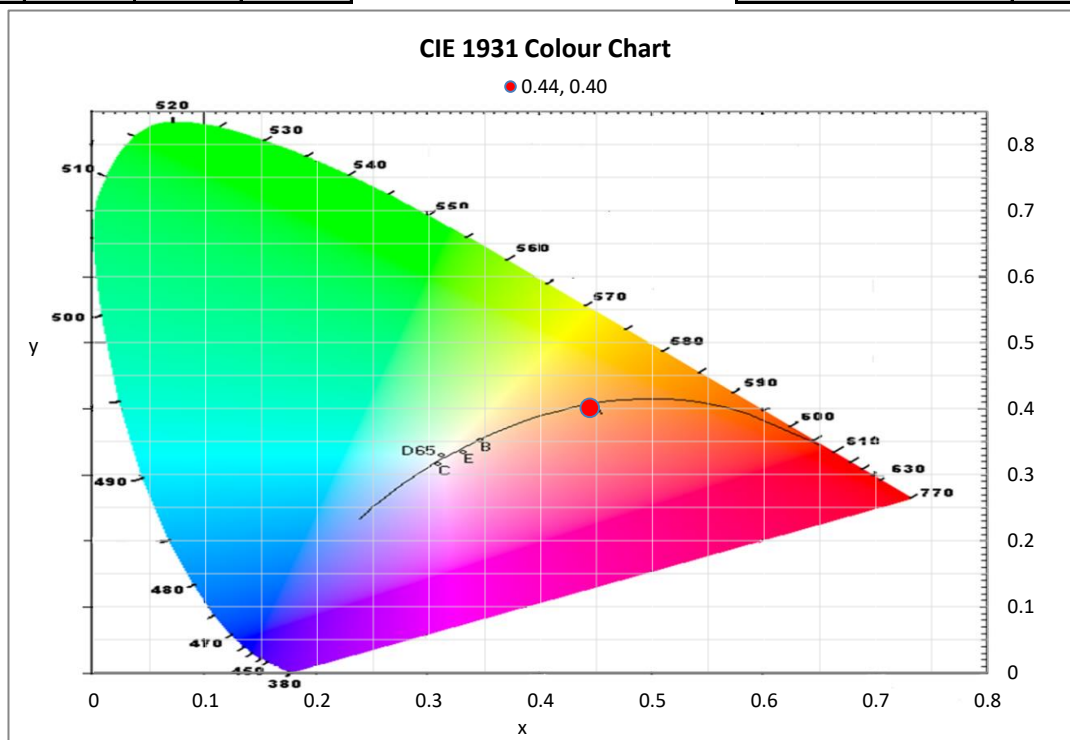
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Wavelength (nm)

Colour Rendering Index Detail			
R1	85	R8	72
R2	92	R9	37
R3	95	R10	79
R4	84	R11	82
R5	84	R12	70
R6	88	R13	87
R7	88	R14	97

Colorimetric Details	
CCT	2858 K
CRI (Ra)	86

Chromaticity Coordinates		
CIE 1931	x	0.4440
	y	0.4012
CIE 1960	u	0.2564
	v	0.3475
CIE 1976	u'	0.2564
	v'	0.5213
Duv		0.0026





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Spectral Power Distribution

λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm
350	6.87E-05	400	3.66E-05	450	4.96E-03	500	2.40E-03
351	4.35E-05	401	2.73E-05	451	5.11E-03	501	2.50E-03
352	1.01E-04	402	4.08E-05	452	5.19E-03	502	2.58E-03
353	8.29E-05	403	3.57E-05	453	5.13E-03	503	2.69E-03
354	1.02E-04	404	3.81E-05	454	5.02E-03	504	2.76E-03
355	1.27E-05	405	3.23E-05	455	4.88E-03	505	2.87E-03
356	6.35E-05	406	4.17E-05	456	4.65E-03	506	3.00E-03
357	8.42E-06	407	3.18E-05	457	4.40E-03	507	3.10E-03
358	2.70E-05	408	2.02E-05	458	4.16E-03	508	3.12E-03
359	4.45E-05	409	4.23E-05	459	3.80E-03	509	3.27E-03
360	1.85E-05	410	4.73E-05	460	3.63E-03	510	3.34E-03
361	1.91E-05	411	4.87E-05	461	3.33E-03	511	3.44E-03
362	9.39E-05	412	6.26E-05	462	3.06E-03	512	3.53E-03
363	4.94E-05	413	5.72E-05	463	3.05E-03	513	3.57E-03
364	0.00E+00	414	7.35E-05	464	2.89E-03	514	3.73E-03
365	2.25E-05	415	1.08E-04	465	2.76E-03	515	3.78E-03
366	7.18E-05	416	1.32E-04	466	2.64E-03	516	3.90E-03
367	0.00E+00	417	1.62E-04	467	2.51E-03	517	3.90E-03
368	7.63E-05	418	1.69E-04	468	2.48E-03	518	4.03E-03
369	5.92E-05	419	2.01E-04	469	2.31E-03	519	4.15E-03
370	0.00E+00	420	2.30E-04	470	2.21E-03	520	4.17E-03
371	8.11E-05	421	2.71E-04	471	2.12E-03	521	4.27E-03
372	4.23E-05	422	3.10E-04	472	2.00E-03	522	4.29E-03
373	0.00E+00	423	3.39E-04	473	1.91E-03	523	4.44E-03
374	3.80E-05	424	4.02E-04	474	1.83E-03	524	4.47E-03
375	2.48E-05	425	4.29E-04	475	1.75E-03	525	4.58E-03
376	0.00E+00	426	4.96E-04	476	1.67E-03	526	4.57E-03
377	6.27E-05	427	5.25E-04	477	1.60E-03	527	4.62E-03
378	2.09E-06	428	6.21E-04	478	1.56E-03	528	4.72E-03
379	3.48E-05	429	6.71E-04	479	1.53E-03	529	4.78E-03
380	2.73E-05	430	7.39E-04	480	1.56E-03	530	4.83E-03
381	3.10E-05	431	8.20E-04	481	1.51E-03	531	4.89E-03
382	0.00E+00	432	9.21E-04	482	1.51E-03	532	4.98E-03
383	2.87E-05	433	9.97E-04	483	1.51E-03	533	5.01E-03
384	8.68E-05	434	1.02E-03	484	1.55E-03	534	5.09E-03
385	3.91E-06	435	1.23E-03	485	1.54E-03	535	5.13E-03
386	7.11E-05	436	1.30E-03	486	1.56E-03	536	5.25E-03
387	8.29E-05	437	1.51E-03	487	1.60E-03	537	5.19E-03
388	0.00E+00	438	1.60E-03	488	1.64E-03	538	5.28E-03
389	1.99E-05	439	1.85E-03	489	1.66E-03	539	5.33E-03
390	2.95E-05	440	2.03E-03	490	1.67E-03	540	5.37E-03
391	3.76E-07	441	2.21E-03	491	1.72E-03	541	5.52E-03
392	6.33E-05	442	2.50E-03	492	1.81E-03	542	5.55E-03
393	3.98E-05	443	2.74E-03	493	1.85E-03	543	5.56E-03
394	1.70E-06	444	3.09E-03	494	1.89E-03	544	5.63E-03
395	2.40E-05	445	3.36E-03	495	1.99E-03	545	5.70E-03
396	5.77E-06	446	3.63E-03	496	2.07E-03	546	5.70E-03
397	3.96E-05	447	4.08E-03	497	2.14E-03	547	5.82E-03
398	3.08E-05	448	4.43E-03	498	2.23E-03	548	5.91E-03



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399	5.64E-05	449	4.59E-03	499	2.33E-03	549	5.98E-03
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Spectral Power Distribution

λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm
550	6.02E-03	600	8.98E-03	650	7.51E-03	700	2.77E-03
551	6.08E-03	601	9.05E-03	651	7.39E-03	701	2.73E-03
552	6.06E-03	602	9.11E-03	652	7.23E-03	702	2.62E-03
553	6.22E-03	603	9.10E-03	653	7.17E-03	703	2.55E-03
554	6.22E-03	604	9.05E-03	654	7.08E-03	704	2.48E-03
555	6.28E-03	605	9.19E-03	655	7.04E-03	705	2.43E-03
556	6.39E-03	606	9.17E-03	656	6.88E-03	706	2.33E-03
557	6.43E-03	607	9.25E-03	657	6.81E-03	707	2.25E-03
558	6.50E-03	608	9.25E-03	658	6.69E-03	708	2.24E-03
559	6.61E-03	609	9.29E-03	659	6.62E-03	709	2.19E-03
560	6.66E-03	610	9.24E-03	660	6.45E-03	710	2.09E-03
561	6.69E-03	611	9.28E-03	661	6.43E-03	711	2.05E-03
562	6.76E-03	612	9.28E-03	662	6.27E-03	712	1.99E-03
563	6.80E-03	613	9.31E-03	663	6.17E-03	713	1.93E-03
564	6.88E-03	614	9.33E-03	664	6.11E-03	714	1.90E-03
565	6.97E-03	615	9.37E-03	665	6.00E-03	715	1.85E-03
566	7.04E-03	616	9.30E-03	666	5.89E-03	716	1.81E-03
567	7.10E-03	617	9.27E-03	667	5.71E-03	717	1.74E-03
568	7.19E-03	618	9.26E-03	668	5.68E-03	718	1.72E-03
569	7.29E-03	619	9.24E-03	669	5.56E-03	719	1.65E-03
570	7.30E-03	620	9.24E-03	670	5.47E-03	720	1.59E-03
571	7.30E-03	621	9.22E-03	671	5.38E-03	721	1.55E-03
572	7.44E-03	622	9.29E-03	672	5.29E-03	722	1.52E-03
573	7.49E-03	623	9.19E-03	673	5.18E-03	723	1.49E-03
574	7.51E-03	624	9.15E-03	674	5.06E-03	724	1.45E-03
575	7.65E-03	625	9.04E-03	675	4.94E-03	725	1.38E-03
576	7.73E-03	626	9.14E-03	676	4.90E-03	726	1.36E-03
577	7.73E-03	627	9.02E-03	677	4.73E-03	727	1.28E-03
578	7.78E-03	628	8.99E-03	678	4.68E-03	728	1.31E-03
579	7.84E-03	629	8.96E-03	679	4.55E-03	729	1.27E-03
580	7.97E-03	630	8.87E-03	680	4.44E-03	730	1.19E-03
581	8.02E-03	631	8.92E-03	681	4.41E-03	731	1.17E-03
582	8.06E-03	632	8.80E-03	682	4.29E-03	732	1.12E-03
583	8.10E-03	633	8.76E-03	683	4.22E-03	733	1.08E-03
584	8.21E-03	634	8.68E-03	684	4.10E-03	734	1.09E-03
585	8.34E-03	635	8.66E-03	685	4.02E-03	735	1.02E-03
586	8.30E-03	636	8.59E-03	686	3.90E-03	736	1.01E-03
587	8.34E-03	637	8.48E-03	687	3.81E-03	737	9.64E-04
588	8.37E-03	638	8.33E-03	688	3.75E-03	738	9.52E-04
589	8.49E-03	639	8.35E-03	689	3.65E-03	739	9.36E-04
590	8.52E-03	640	8.34E-03	690	3.55E-03	740	9.16E-04
591	8.57E-03	641	8.18E-03	691	3.48E-03	741	8.58E-04
592	8.63E-03	642	8.16E-03	692	3.39E-03	742	8.38E-04
593	8.72E-03	643	8.08E-03	693	3.32E-03	743	8.31E-04
594	8.70E-03	644	7.95E-03	694	3.25E-03	744	8.32E-04
595	8.80E-03	645	7.94E-03	695	3.12E-03	745	7.70E-04
596	8.80E-03	646	7.84E-03	696	3.03E-03	746	7.45E-04
597	8.90E-03	647	7.77E-03	697	2.96E-03	747	7.24E-04
598	8.93E-03	648	7.62E-03	698	2.93E-03	748	7.37E-04



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599	8.91E-03	649	7.57E-03	699	2.85E-03	749	6.65E-04
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Spectral Power Distribution

λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm	λ (nm)	W/nm
750	6.78E-04	763	4.62E-04	776	2.95E-04	789	2.02E-04
751	6.53E-04	764	4.40E-04	777	2.91E-04	790	2.13E-04
752	6.33E-04	765	4.42E-04	778	3.29E-04	791	2.05E-04
753	6.23E-04	766	3.93E-04	779	2.86E-04	792	1.92E-04
754	5.70E-04	767	3.95E-04	780	2.98E-04	793	1.89E-04
755	5.82E-04	768	3.81E-04	781	2.66E-04	794	1.62E-04
756	5.55E-04	769	3.94E-04	782	2.76E-04	795	1.65E-04
757	5.42E-04	770	3.89E-04	783	2.27E-04	796	1.78E-04
758	5.14E-04	771	3.69E-04	784	2.42E-04	797	1.34E-04
759	5.25E-04	772	3.31E-04	785	2.45E-04	798	1.42E-04
760	5.10E-04	773	3.16E-04	786	2.02E-04	799	1.26E-04
761	4.90E-04	774	3.77E-04	787	2.27E-04	800	1.60E-04
762	4.80E-04	775	3.46E-04	788	2.05E-04		



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Measurement Uncertainty

The following is the reported expanded uncertainty of the LMS 400 1m Integrating Sphere Spectroradiometer System.

Parameter	Uncertainty
Total Luminous Flux	$\pm 5.6\%$
Correlated Color Temperature	± 100 K
CRI	± 2
Chromaticity x	± 0.005
Chromaticity y	± 0.005
Voltage (300 V, 50/60 Hz)	± 0.061 V _{rms}
Current (200 mA, 50/60Hz)	± 0.07 mA _{rms}
Current (0.5 A, 50/60Hz)	± 0.16 mA _{rms}
Current (5 A, 50/60Hz)	± 0.0016 A _{rms}
Power (300 V, 200 mA, 50/60 Hz)	± 0.032 W _{rms}
Power (300 V, 0.5 A, 50/60 Hz)	± 0.09 W _{rms}
Power (300 V, 5 A, 50/60 Hz)	± 0.0009 kW _{rms}
Frequency (50/60 Hz)	± 0.001 Hz
Power Factor	± 0.0006 PF

The reported expanded uncertainty is based on the combined standard uncertainty multiplied by a coverage factor of $k = 2$. This value of k gives a coverage probability of approximately 95%, assuming a normal distribution. This determination of the measurement uncertainty has been done in accordance with international requirements including UKAS, BIPM Guide to the Expression of Uncertainty in Measurement and CIE 198:2011.

----- END OF REPORT -----